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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 126

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CONTENTS

ASIA

AUSTRALIA

Agreement With Japan on Nuclear Safeguards Stalled
(THE AGE, 12 Oct 81; THE AUSTRALIAN, 13, 15 Oct 81) 1

Snag in Talks, by Lorenzo Boccabella
Possibility of New Talks
Unresolved Enrichment Offer, by Alan Goodall

French Nationalization Affects Uranium Mining Here
(THE AUSTRALIAN, 8 Oct 81) 3

Uranium Pilot Processing Plant Projected for South
(THE WEST AUSTRALIAN, 13 Oct 81) 4

INDIA

Slack in Nuclear Power Development Deplored
(Editorial; THE HINDU, 13 Nov 81) 5

Tarapur Talks Prove Differences With U.S.
(N. Ram; THE HINDU, 15 Nov 81) 7

Correspondent Reports Final Round of Tarapur Talks
(N. Ram; THE HINDU, 16 Nov 81) 9

Ways To End Tarapur Fuel Agreement Considered
(G. K. Reddy; THE HINDU, 17 Nov 81) 11

Briefs
Proposed Nuclear Science Institute 13

PAKISTAN

Discrimination Toward Third World Nuclear Development Charged
(Editorial; BUSINESS RECORDER, 28 Nov 81).................... 14

Briefs
- Attack on Pak N-Reactor 16

LATIN AMERICA

ARGENTINA

Enriched Uranium Purchase From USSR To Be Finalized
(LA PRENSA, 25 Nov 81).................................... 17

Briefs
- Nuclear War Prevention Draft 19
- Nuclear Exchange With FRG 19

BRAZIL

Nuclear Agreement To Be Signed With UK
(Laura Fonseca; O GLOBO, 1 Dec 81)......................... 20

Briefs
- New Nuclear Power Plants 21

MEXICO

Sweden Hopes for Nuclear Plant Contracts
(SVENSKA DAGBLADET, 6 Nov 81).............................. 22

NEAR EAST AND NORTH AFRICA

EGYPT

Briefs
- Nuclear Agreement 24
- Reactor Sites 24

SUB-SAHARAN AFRICA

SOUTH AFRICA

Koeberg Nuclear Fuel Loading Will Begin in June
(THE STAR, 14 Nov 81)..................................... 25

WEST EUROPE

FRANCE

Recent Status of Electronuclear Construction Viewed
(M. Poyatos, Y Peyrouse; REVUE GENERAL NUCLEAIRE, Jul-Aug 81) 26

SWEDEN

Breakdown in Ringhals III Nuclear Plant Proves Costly
(SVENSKA DAGBLADET, 29 Nov 81) 40

AUSTRALIA

AGREEMENT WITH JAPAN ON NUCLEAR SAFEGUARDS STALLED

Snag in Talks

Melbourne THE AGE in English 12 Oct 81 p 3

[Article by Lorenzo Boccabella]

[Text] CANBERRA. — The latest round of talks between Australia and Japan on uranium safeguards has failed to reach an agreement to enable exports to proceed.

It is understood that among the issues still unsettled is the inspection of nuclear processing plants after production.

Some of Australia's uranium sales may be delayed if the negotiations are not completed before early next year, as the Federal Government will only allow exports to countries which have entered into safeguard agreements with Australia.

Japan has proved a difficult customer in negotiations for an agreement. Talks began in August 1978 and the latest negotiations represent the seventh round of formal talks. They are expected to begin again before the end of the year.

It is understood that some progress was made during the three weeks of talks in Tokyo. Officials will brief Ministers on them this week.

Possibility of New Talks

Canberra THE AUSTRALIAN in English 13 Oct 81 p 17

[Text] RANGER uranium exports to Japan will almost certainly be delayed because Australian and Japanese officials have again failed to reach agreement on a nuclear safeguards code.

Another round of talks between the two delegations is likely to take place before the end of the year — possibly as soon as next month — in a last-ditch effort to thrash out an agreement.

But even if an agreement is reached before the end of the year, the export of U3O8 (uranium oxide) from the Ranger deposits in the Northern Territory to Japan is not expected to go ahead as scheduled.

Ranger now has contracts with the Japanese Government and electricity utilities amounting to 13,500 short tonnes of U3O8 between 1982 and 1996.

The mine is scheduled to start shipping uranium to Japan next March, but the Japanese Diet (Parliament) is not expected to have ratified the nuclear safeguards agreement by then.

The Federal Government's policy does not allow the supply of uranium to countries which have not signed such an agreement.

The Australian delegation arrived back from Tokyo last Friday after a marathon seventh round of negotiations.

The talks again broke down because of what the Japanese saw as threats to their national sovereignty, resulting from Australian inspection requirements.

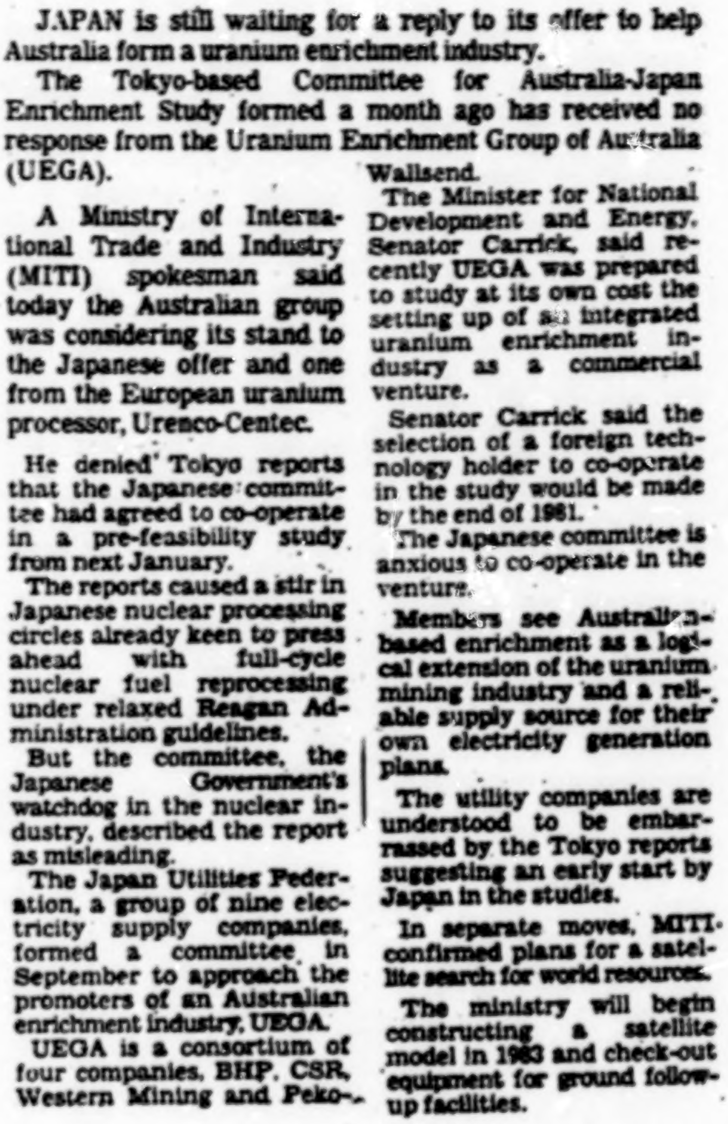
A spokesman for the Department of Foreign Affairs yesterday refused to discuss details of the talks, but it is understood the Japanese are opposed to plant inspections by Australian officials.

Unresolved Enrichment Offer

Canberra THE AUSTRALIAN in English 15 Oct 81 p 15

[Article by Alan Goodall]

[Text]



JAPAN is still waiting for a reply to its offer to help Australia form a uranium enrichment industry.

The Tokyo-based Committee for Australia-Japan Enrichment Study formed a month ago has received no response from the Uranium Enrichment Group of Australia (UEGA).

A Ministry of International Trade and Industry (MITI) spokesman said today the Australian group was considering its stand to the Japanese offer and one from the European uranium processor, Urenco-Centec.

He denied Tokyo reports that the Japanese committee had agreed to co-operate in a pre-feasibility study from next January.

The reports caused a stir in Japanese nuclear processing circles already keen to press ahead with full-cycle nuclear fuel reprocessing under relaxed Reagan Administration guidelines.

But the committee, the Japanese Government's watchdog in the nuclear industry, described the report as misleading.

The Japan Utilities Federation, a group of nine electricity supply companies, formed a committee in September to approach the promoters of an Australian enrichment industry, UEGA.

UEGA is a consortium of four companies, BHP, CSR, Western Mining and Peko-Wallsend.

The Minister for National Development and Energy, Senator Carrick, said recently UEGA was prepared to study at its own cost the setting up of an integrated uranium enrichment industry as a commercial venture.

Senator Carrick said the selection of a foreign technology holder to co-operate in the study would be made by the end of 1981.

The Japanese committee is anxious to co-operate in the venture.

Members see Australian-based enrichment as a logical extension of the uranium mining industry and a reliable supply source for their own electricity generation plans.

The utility companies are understood to be embarrassed by the Tokyo reports suggesting an early start by Japan in the studies.

In separate moves, MITI confirmed plans for a satellite search for world resources.

The ministry will begin constructing a satellite model in 1983 and check-out equipment for ground follow-up facilities.

CSO: 5100/7506

FRENCH NATIONALIZATION AFFECTS URANIUM MINING HERE

Canberra THE AUSTRALIAN in English 8 Oct 81 p 15

[Text]

QUEENSLAND'S Government is facing embarrassment over a decision by the Mitterand administration in France to nationalise at least 11 French companies.

The companies include Pechiney Ugine Kuhlmann, which owns 50 per cent of Minatome, Australia, Pty Ltd.

Minatome will mine uranium reserves at its Ben Lomond site near Townsville, North Queensland, under an earlier-approved lease, and will start to produce by 1985.

Although Minatome's application for an extension of its mining lease, tailing stockpile area, and treatment-plant site has been refused by the Mining Wardens Court on the ground that it would be unsafe, indications are that Joh Bjelke-Petersen's Government may overturn that decision.

The Minister for Mines and Energy, Mr Gibbs, said last week that the best means of dealing with uranium was to sell it while there was still a world market for it.

But yesterday the co-ordinator of the Townsville Conservation Council, Mr Adrian Jeffreys, asked: "Now that Mitterand is preparing to nationalise half of Minatome, where does that leave Australia?

"The French Government — a Socialist administration with Communist members of the Cabinet — will still have a very aggressive nuclear policy.

"It would seem to be the height of irony that the Bjelke-Petersen administration could have what is a highly destructive socialist nuclear cell within its own borders."

Mr Jeffreys said it might be a good move by the Bjelke-Petersen administration to consider the whole future of its uranium policies.

CSO: 5100/7506

URANIUM PILOT PROCESSING PLANT PROJECTED FOR SOUTH

Perth THE WEST AUSTRALIAN in English 13 Oct 81 p 57

[Text]

The development of the Honeymoon uranium project in South Australia moved a step closer yesterday with the announcement that preparations were under way for the construction of a pilot processing plant.

North Kalgurli Mines Ltd, one of the partners, said in its quarterly report that a submission seeking full development status for the project had been sent to the Minister for Trade and Resources.

Pending this approval preparations for the construction of the plant had begun.

The Honeymoon deposit, containing about 3400 tonnes of uranium oxide is to be mined—using chemical solution . techniques—by a consortium consisting of North Kalgurli, Teton Australia Pty Ltd, MIM Holdings Ltd, and AAR Ltd, a wholly owned subsidiary of CSR Ltd.

The proposed mine site is about 75km north-west of Broken Hill in the Lake Frome district of north-east South Australia.

The directors also announced in the quarterly that samples from 67 drilling holes in an area adjacent to the Honeymoon deposit were being evaluated.

In November last year, the partners in the project announced that it would be the first in Australia to use solution mining, or a leaching method, to extract and process uranium deposits for the export market.

In a 74-page draft environmental impact statement also released in November, the partners said that a full-scale commercial plant would depend on the results gained from the pilot plant.

However, it was envisaged that such a plant would operate for seven to 10 years, producing an average of 450 tonnes of uranium oxide a year as dried yellowcake for international markets.

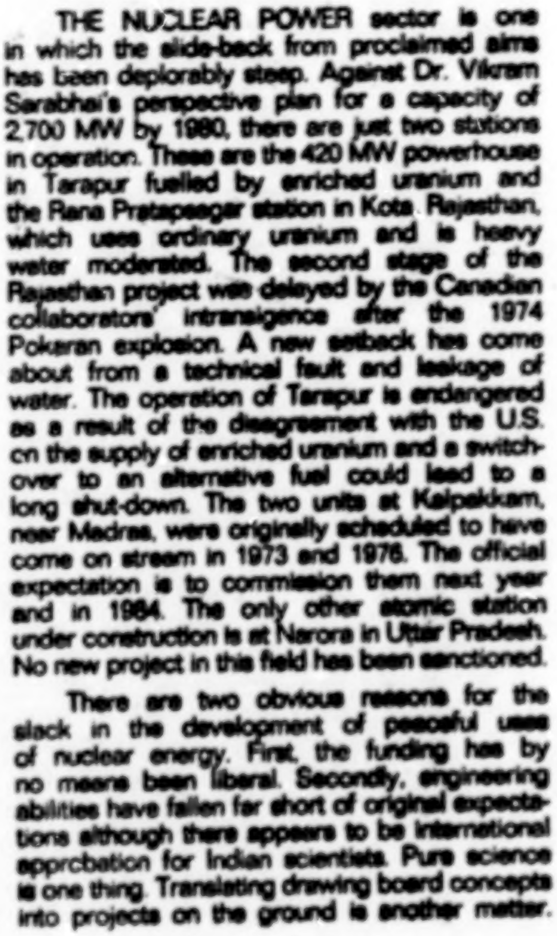
CSO: 5100/7506

SLACK IN NUCLEAR POWER DEVELOPMENT DEPLORED

Madras THE HINDU in English 13 Nov 81 p 8

[Editorial]

[Text]



THE NUCLEAR POWER sector is one in which the slide-back from proclaimed aims has been deplorably steep. Against Dr. Vikram Sarabhai's perspective plan for a capacity of 2,700 MW by 1980, there are just two stations in operation. These are the 420 MW powerhouse in Tarapur fuelled by enriched uranium and the Rana Pratapsagar station in Kota, Rajasthan, which uses ordinary uranium and is heavy water moderated. The second stage of the Rajasthan project was delayed by the Canadian collaborators' intransigence after the 1974 Pokaran explosion. A new setback has come about from a technical fault and leakage of water. The operation of Tarapur is endangered as a result of the disagreement with the U.S. on the supply of enriched uranium and a switch-over to an alternative fuel could lead to a long shut-down. The two units at Kalpakkam, near Madras, were originally scheduled to have come on stream in 1973 and 1976. The official expectation is to commission them next year and in 1984. The only other atomic station under construction is at Narora in Uttar Pradesh. No new project in this field has been sanctioned.

There are two obvious reasons for the slack in the development of peaceful uses of nuclear energy. First, the funding has by no means been liberal. Secondly, engineering abilities have fallen far short of original expectations although there appears to be international approbation for Indian scientists. Pure science is one thing. Translating drawing board concepts into projects on the ground is another matter.

The tentative plan is to add ten more units of the Narora type of 235 MW each. This will be a mirage unless the construction technology is upgraded and accelerated. The working group on energy policy, in its 1979 report, suggested that the country should aim at an installed nuclear capacity of 10,000 MW in a total of 100,000 MW of all powerhouses. Such a tenfold increase in 20 years in nuclear installations will be a big test for self-reliant technological advance. The present work on the design of larger generating units is only one aspect of the efforts for expansion. The tasks before the Department of Atomic Energy are indeed challenging, especially since the industrialised nations have ganged up to stifle development in this sector by the Third World countries which have refused to affix their signature on the dotted line in the discriminatory non-proliferation treaty.

CSO: 5100/7022

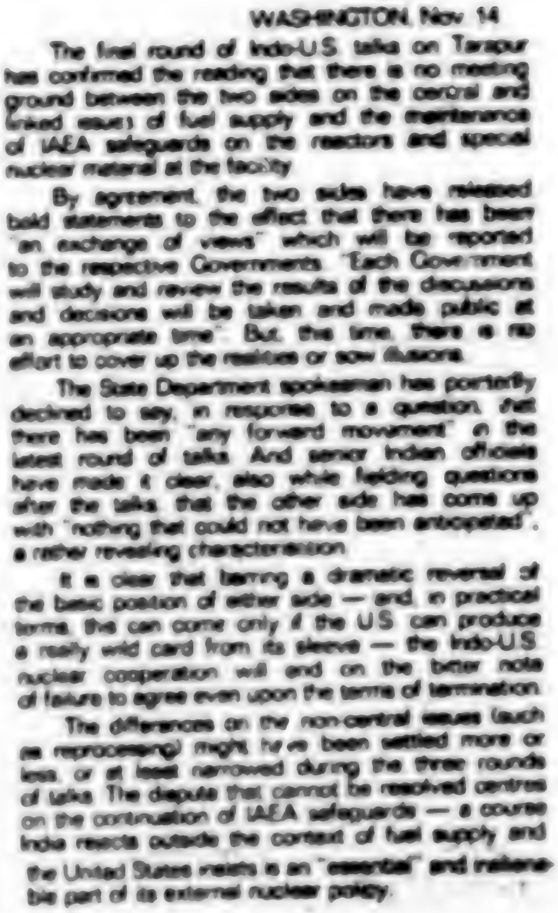
INDIA

TARAPUR TALKS PROVE DIFFERENCES WITH U.S.

Madras THE HINDU in English 15 Nov 81 p 1

[Article by N. Ram]

[Text]



WASHINGTON, Nov 14

The final round of Indo-U.S. talks on Tarapur has confirmed the reading that there is no meeting ground between the two sides on the central and linked issues of fuel supply and the maintenance of IAEA safeguards on the reactors and special nuclear material at the facility.

By agreement, the two sides have released bald statements to the effect that there has been "an exchange of views" which will be reported to the respective Governments. "Each Government will study and review the results of the discussions and decisions will be taken and made public at an appropriate time". But, this time, there is no effort to cover up the realities or sow illusions.

The State Department spokesman has pointedly declined to say, in response to a question, that there has been "any forward movement" in the latest round of talks. And senior Indian officials have made it clear, also while fielding questions after the talks, that the other side has come up with "nothing that could not have been anticipated", a rather revealing characterisation.

It is clear that barring a dramatic reversal of the basic position of either side — and, in practical terms, this can come only if the U.S. can produce a really wild card from its sleeve — the Indo-U.S. nuclear cooperation will end on the bitter note of failure to agree even upon the terms of termination.

The differences on the non-central issues (such as reprocessing) might have been settled more or less, or at least narrowed during the three rounds of talks. The dispute that cannot be resolved centres on the continuation of IAEA safeguards — a course India rejects outside the context of fuel supply and the United States insists is an "essential" and inalienable part of its external nuclear policy.

Although the official talks are over, Mr. James L. Malone, the Assistant Secretary of State who led his side in all three rounds of talks between April and November, has sought one more chance to "keep in touch" on Tarapur while he visits India in the first week of December in connection with co-chairing the meeting of the sub-commission on scientific and technological cooperation. And, should anything come out of this, there is the visit by the U.S. Secretary of State, Mr. Alexander Haig, in mid-December to be taken advantage of as a high-level political opportunity to follow it up.

As already reported in these columns, the attempt by the United States has been concentrated, from the New Delhi round in July, on making India keep the IAEA safeguards by finding a "new" external source of supply of low-enriched uranium fuel, preferably France or the Soviet Union. In fact, a supplement to the U.S. "non-paper" presented to the Indian delegation earlier makes this proposal explicitly — within the context of U.S. "flexibility" and willingness to take a "low-key and unobtrusive" role in the business, provided India agrees "voluntarily" to continue IAEA safeguards by forging a new external supply agreement with "a third country".

The associated effort is to deflect India from the mixed oxide fuel ("MOX") route for Tarapur — a decision taken at the Cabinet level and communicated to the United States. Reportedly, something in the region of Rs 38 crores has been expended on the programme over the longer term, and the Indian side has authoritatively informed Mr. Malone and co that there is no question of "retracing" the major steps taken, especially in terms of investment, in the development of the mixed oxide fuel

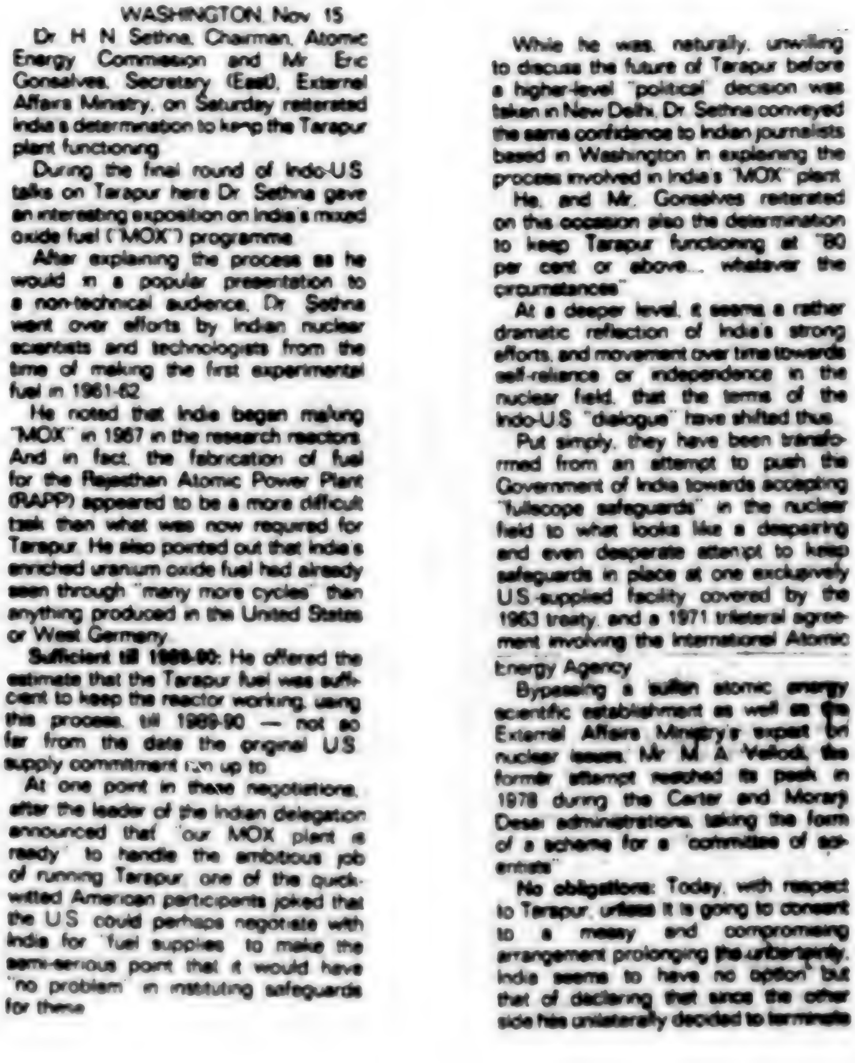
CSO: 5100/7023

CORRESPONDENT REPORTS FINAL ROUND OF TARAPUR TALKS

Madras THE HINDU in English 16 Nov 81 p 5

[Article by N. Ram]

[Text]



WASHINGTON, Nov 15

Dr H N Sethna, Chairman, Atomic Energy Commission and Mr Eric Gonsalves, Secretary (East), External Affairs Ministry, on Saturday reiterated India's determination to keep the Tarapur plant functioning.

During the final round of Indo-U.S. talks on Tarapur here Dr. Sethna gave an interesting exposition on India's mixed oxide fuel ("MOX") programme.

After explaining the process as he would in a popular presentation to a non-technical audience, Dr. Sethna went over efforts by Indian nuclear scientists and technologists from the time of making the first experimental fuel in 1961-62.

He noted that India began making "MOX" in 1967 in the research reactors. And in fact, the fabrication of fuel for the Rajasthan Atomic Power Plant (RAPP) appeared to be a more difficult task than what was now required for Tarapur. He also pointed out that India's enriched uranium oxide fuel had already seen through "many more cycles" than anything produced in the United States or West Germany.

Sufficient till 1989-90: He offered the estimate that the Tarapur fuel was sufficient to keep the reactor working, using this process, till 1989-90 — not so far from the date the original U.S. supply commitment ran up to.

At one point in these negotiations, after the leader of the Indian delegation announced that "our MOX plant is ready" to handle the ambitious job of running Tarapur, one of the quick-witted American participants joked that the U.S. could perhaps negotiate with India for "fuel supplies" to make the semi-serious point that it would have "no problem" in instituting safeguards for these.

While he was, naturally, unwilling to discuss the future of Tarapur before a higher-level "political" decision was taken in New Delhi, Dr. Sethna conveyed the same confidence to Indian journalists based in Washington in explaining the process involved in India's "MOX" plant.

He, and Mr. Gonsalves reiterated on this occasion also the determination to keep Tarapur functioning at "80 per cent or above... whatever the circumstances."

At a deeper level, it seems a rather dramatic reflection of India's strong efforts, and movement over time towards self-reliance or independence in the nuclear field, that the terms of the Indo-U.S. "dialogue" have shifted thus.

Put simply, they have been transformed from an attempt to push the Government of India towards accepting "fullscope safeguards" in the nuclear field to what looks like a despairing and even desperate attempt to keep safeguards in place at one exclusively U.S.-supplied facility covered by the 1963 treaty, and a 1971 trilateral agreement involving the International Atomic Energy Agency.

Bypassing a sullen atomic energy scientific establishment as well as the External Affairs Ministry's expert on nuclear issues, Mr M. A. Vellodi, the former attempt reached its peak in 1978 during the Carter and Morarji Desai administrations, taking the form of a scheme for a "committee of scientists."

No obligations: Today, with respect to Tarapur, unless it is going to consent to a messy and compromising arrangement prolonging the uncertainty, India seems to have no option but that of declaring that since the other side has unilaterally decided to terminate the supply relationship and is in clear "material breach" of the 1963 agreement by its "non-performance" on fuel supplies, the treaty has ceased to exist — and along with it, the obligations it carries, including safeguards.

This, of course, is a far cry from the "mutually agreed termination", that has provided the "framework" for the Tarapur talks from the moment Mr James Malone, Assistant Secretary of State, opened them in Washington in April there is what looks like an unanswerable international law basis to the Indian stand. But the decisive, in a sense irreversible, step can be authorised only at the highest political level in New Delhi.

The United States has (as has been reported in these columns and repeated in a report on Saturday in the columns of the "Washington Post") issued warnings that the unprecedented dismantling of IAEA safeguards from a safeguard nuclear facility would have serious bilateral and international consequences. And here the executive branch has used the inevitability of a "strong" and "sharp" reaction from Congress as a lever in the negotiations.

If one were able to abstract, for the purposes of political analysis, from the details, the three rounds of talks over eight months seem to be not so much a negotiation over the present and immediate future of Tarapur.

The strong (at times crude) reaction by the Reagan Administration, the warnings uttered and implied, the tendency to blow hot and cold, the posture of "flexibility", the game of playing and surrendering all cards barring "safeguards" bearing a supply stamp (the principle embodied in article 6 of the 1963 agreement) clarify one process.

It is really a debate over the meaning of independence or self-reliance in the nuclear field, the first principle of which in international affairs is discrimination.

One side finds the development virtually impossible to swallow, although it knows it cannot run away from it. And the other side, India, finds that the painful process gone through, involving attempts at compromise underline the real strength.

The larger point about the advantages of self-reliance needs to be made at a time when a very major compromise has been instituted in the economic field, in the shape of the five billion SDR deal with the International Monetary Fund.

CSO: 5100/7025

WAYS TO END TARAPUR FUEL AGREEMENT CONSIDERED

Madras THE HINDU in English 17 Nov 81 p 1

[Article by G.K. Reddy]

[Text]

NEW DELHI Nov 16.

The Government of India which has lost all hopes of terminating the Tarapur fuel supply agreement through mutual consent, has started exploring ways of ending it without any residuary obligations that are detrimental to its interests.

It proposes to wait until one more effort has been made at the political level next month, during the visit of the U.S. Secretary of State, General Alexander Haig, before finalising the modalities for unilateral termination.

A broad hint of how India intends to proceed will be given either by the Prime Minister, Mrs. Indira Gandhi, or the External Affairs Minister, Mr. P. V. Narasimha Rao, when the issue is raised in Parliament by members seeking details of what happened during the latest round of talks in Washington.

Diplomatic channels to be explored: Meanwhile, the Government will continue to explore through diplomatic channels the possibilities of an amicable termination that would free both sides of their commitments, if the U.S. is bent on going back on its solemn obligations.

The Secretary in the External Affairs Ministry, Mr. Eric Gonsalves, who returned today from Washington, gave the Government a detailed summation of the latest round of talks along with his own interpretation of the U.S. intentions.

He apparently come back with the distinct impression that the U.S. would strive hard till the very end to retain the safeguards after the termination.

U.S. move unknown: But it remains to be seen whether the Reagan Administration is going to exert undue political pressures in an avowed bid to compel India to agree to the retention of the safeguards either as a voluntary gesture, as it did in the case of the Rajasthan plant after the suspension of Canadian cooperation, or as a residuary obligation even after the termination of the fuel agreement.

The first hint of the U.S. intentions might be available during General Haig's visit, although it is equally likely that he might try to keep the issue in abeyance by simply not talking about it.

The U.S. Assistant Secretary of State, Mr. James Malone, who has been conducting the Tarapur talks, is also due to visit Delhi early next month to attend the meeting of the Sub-Commission on Science and Technology, before General Haig arrives later for the ministerial meeting of the Indo-American Joint Commission.

There will be some indication during Mr. Malone's visit whether General Haig would be coming with some new ideas on the subject.

Indian approach: The Indian approach is not to leave the initiative entirely to the U.S. which can afford to prolong the suspense after refusing to comply with its fuel supply commitments.

The External Affairs Ministry will not let go the opportunity to raise this issue with the new American Ambassador, Mr. Harry Barnes, when he calls on the Foreign Minister and other senior officials after the presentation of his credentials tomorrow to the President.

The new US envoy was due to present his credentials on November 26 in the normal course, but the Government agreed to advance the date when it was found that the Egyptian Ambassador-designate who had arrived in Delhi earlier and was entitled to take precedence over him had not received his new letter of credence.

He had come with the letter signed by the late President Sadat which had to be replaced with a new one bearing the signature of the new President of Egypt before its presentation.

Fresh application filed recently: After India filed a fresh application recently for the supply of enriched uranium for 1982 in accordance with the prescribed time schedule, there are now three pending requests with the US for the shipment of altogether 56 tonnes.

But there is no evidence of any inclination on the part of the present administration to release even the remaining one of the two shipments cleared in President Carter's time.

The former Secretary of State, Mr. Edmund Muskie, had assured the Foreign Relations Committee of the Senate in a letter last year that he would inform it of any material change in the Indian position, before actually shipping the remaining instalment.

Clear breach of contractual obligation: As there has been no futher Indian test or any violation of the safeguards part, the U.S. refusal to authorise even this shipment amounts in India's view to a clear breach of its contractual obligation.

In India's view, no further proof is necessary of the U.S. disinclination to abide by the terms of the agreement than this deliberate refusal to authorise even this single fuel shipment.

So the legal experts of the Government are maintaining that the U.S. has no locus standi at all to engage in any parleys for either determining alternate sources of fuel supply to keep the safeguards alive, or stand in the way of India's own plans to run the Tarapur plant with mixed oxide.

Agreement dead for practical purposes: A spokesman of the External Affairs Ministry made a brief statement today which was more or less on the same lines as what the Indian negotiators had said in Washington.

But it was quite evident from the tone and tenor of the comments made by other sources that the agreement was now dead as a dodo for all practical purposes and, if a decent burial could not be arranged by mutual consent, India would have to perform all alone the distasteful task of these funeral rites.

CSO: 5100/7026

INDIA

BRIEFS

PROPOSED NUCLEAR SCIENCE INSTITUTE--Varanasi, Nov 14 (UNI)--The proposals for setting up Malaviya Institute of Nuclear Sciences in Banaras Hindu University is being revived after remaining in cold storage for two decades. Initiated in 1960-61 the proposal had sought to create a powerful centre for research in nuclear sciences in the northern region. A team from the Atomic Energy Commission had also visited the university in 1962 to discuss the project. The BHU was later asked to wait before implementing the project estimated to cost Rs. one crore at that time. Dr Shukla, Head of the Chemistry Department of the university says the scientists of Bhabha Atomic Research Centre, Bombay, have now evidenced keen interest in the salient features of the project and have assured to look into the proposal when received. Dr Shukla who is also the president of Indian Association of Nuclear Chemists which came into being earlier this month, expects the newly set up Association also to provide help in the implementation of the project. [Text] [New Delhi PATRIOT in English 15 Nov 81 p 4]

CSO: 5100/7024

DISCRIMINATION TOWARD THIRD WORLD NUCLEAR DEVELOPMENT CHARGED

Karachi BUSINESS RECORDER in English 28 Nov 81 p 2

[Editorial: "Nuclear Technology for Peaceful Purposes"]

[Text] Pakistan's ambassador to the UN, Niaz A. Naik, has recently drawn the attention of the world community towards the discriminatory attitude of the rich nations with regard to the development of nuclear energy by the developing countries like Pakistan. Speaking in the General Assembly on the report of the International Atomic Energy Agency, he said that it is great injustice to deprive the developing countries from acquiring nuclear know-how for peaceful uses in future on the pretext of control of proliferation of nuclear arms. He pointed out nuclear proliferation could be prevented only by an international regime covering both the nuclear haves and have-nots and not by unilateral restrictions. He reminded the Assembly of the existing IAEA safeguard system and said his country fully supported this system which guaranteed peaceful use of nuclear technology and prevented its use for other purposes.

The points raised by him are more than pertinent in the existing conditions when the industrially advanced countries have stepped up their opposition to free acquisition of nuclear technology and the ever rising oil prices have over-burdened their budgets. Their very survival is at stake unless they find some alternate source of cheap energy to meet their development needs. Nuclear energy provides the cheapest source of power in the long run. And it is for this reason that more and more developing countries are engaged in attaining nuclear capability to enable them to meet their long-term development requirements. Already there are about 240 nuclear power plants working in 22 countries generating about 1,25,000 MW of electricity. The International Atomic Energy Agency keeps a close watch under its safeguards system and regularly inspects nuclear installations to check that materials supplied for producing electricity are not diverted to non-peaceful uses. However, there are some industrialised countries which arbitrarily decide which countries should be given nuclear supplies without referring the matter to IAEA.

This is done for political reasons and is highly discriminatory. There are countries which have attained the capability to manufacture atomic weapons. But the same powers which apply all sorts of sanctions against the developing countries on the most flimsy grounds keep mum even after receiving the information of their having atomic weapons. Despite the fact that IAEA has been inspecting nuclear installations in Pakistan for the last 10 years and has certified that "the inspection disclosed no departure from the terms of the safeguards agreement covering the facilities and materials concerned", yet Pakistan's nuclear programme has been the target of deliberate propaganda all over the world and wilest of cooked up stories have been circulated and threats given. Not only that pressure was brought upon some countries which had entered into agreement with this country for the supply of necessary equipment to break the contracts which they did.

In a situation like this when it is necessary that an international agreement be there among all the states of the world, both nuclear and non-nuclear, covering access to and use of nuclear technology for peaceful purposes. It is only in this way that the threat of proliferation can be checked as well as the needs of the poorer countries can be met.

CSO: 5100/4507

BRIEFS

ATTACK ON PAK N-REACTOR--Lahore, Nov. 30--PLO AMBASSADOR TO PAKISTAN MR. KHAIRUDDIN ABDUL REHMAN SAID HERE TODAY THAT ISRAEL COULD LAUNCH AN ATTACK ON PAKISTAN NUCLEAR REACTOR AT ANY TIME LIKE ITS RAID ON IRAQI NUCLEAR INSTALLATIONS. He said Israel would do so because of Pakistan's and its people's consistent support for the cause of the liberation of Palestine. He was addressing a function to observe the International Day of Solidarity with Palestinians at the Pakistan National Centre. The Ambassador added that Israeli sources were observed a few days back as saying that Pakistan nuclear reactor would be their next target, but he said that Palestinians and Pakistanis would valiantly foil the proposed expansionist designs of Israeli aggression. [Text] [Karachi MORNING NEWS in English 1 Dec il p 1]

CSO: 5100/4508

ENRICHED URANIUM PURCHASE FROM USSR TO BE FINALIZED

Buenos Aires LA PRENSA in Spanish 25 Nov 81 p 2

[Text] Moscow (EFE)--Argentina will be purchasing enriched uranium from the Soviet Union, reliable sources in this capital city told the EFE agency today.

The enriched uranium purchase could take place before the end of the year, under the terms of the contract that the two countries are about to conclude.

An Argentine mission was recently in Moscow discussing the technical details of the transaction with the Soviet enterprise Techsnabexport. Buenos Aires authorities are currently studying those details.

Once the technical study of the contract is completed, it will probably be signed by the National Atomic Energy Commission (CNEA) of Argentina and the aforementioned Soviet enterprise, although this point has not yet been conclusively decided on.

Enriched uranium supplies from the Soviet Union would cover only part of Argentina's needs for peaceful purposes. Argentina uses natural uranium in its atomic powerplants and is a leader in this field in Latin America.

Nuclear Cooperation

Furthermore, according to the sources, we can expect an increase over the next few years in Soviet cooperation with Argentina in the field of nuclear powerplants. The USSR plans accelerated development of these plants over the current decade.

This sphere of Argentine-Soviet cooperation will bolster the strong economic ties between the two countries, which offer solid prospects for the future.

Trade between Argentina and the USSR will top $3.5 billion this year, with the balance heavily in Argentina's favor because of the huge grain sales that the country (one of the world's four leading producers and exporters of grain) has made to the Soviet Union.

Argentine grain sales to the Soviet Union so far in 1981 total more than 15 million tons.

In addition to grains, Argentina sells other important items on the Soviet market, such as meat, wool, hides, vegetable oils, sugar and manufactured goods, tubing in particular.

Argentina buys very little from the USSR, with sales limited to sodium dichromate and machinery.

Trade Balance

The Soviet Union is interested in leveling off its trade balance with Argentina, which is heavily in favor of the rich Latin American country.

To this end, an Argentine mission traveled to Moscow a few months ago and agreed to the purchase of $50 million worth of Soviet industrial goods. So far, however, purchases of only $23 million have gone through, and the remaining amount will have to be negotiated by other Argentine delegations that are expected in the USSR next January and March.

According to industry sources consulted in Moscow, an increase in Argentina's imports of Soviet goods would favorably affect the stability of the two countries' trade balance.

The impact would be favorable not only because a boost in imports would be a goodwill gesture by Argentina, but also because the Soviets are prepared to "recycle" this foreign exchange by making additional purchases from their main "partner" in Latin America.

8743
CSO: 5100/2047

BRIEFS

NUCLEAR WAR PREVENTION DRAFT--(NA)--An Argentine draft to prevent nuclear war has been approved by the first committee of the United Nations' General Assembly, the Argentine delegation to the UN informed the Foreign Ministry. The Argentine proposal includes a recommendation for every state armed with nuclear weapons to submit to UN Secretary-General Kurt Waldheim before 30 April next year a list of "opinions, proposals and suggestions aimed at guaranteeing the prevention of a nuclear confrontation." Those suggestions would then be studied during the second stage of meetings of the General Assembly, focusing on disarmament. The Argentine proposal also requests the secretary-general to submit a report containing those proposals, opinions and suggestions, together with those contributed by other UN member states. [Text] [PY292035 Buenos Aires HERALD in English 28 Nov 81 p 9]

NUCLEAR EXCHANGE WITH FRG--It has been reported that the first meeting for the implementation of the agreement signed by the National Atomic Energy Commission and the FRG Interior Federal Ministry was held in Buenos Aires on 23 and 24 November 1981. The agreement refers to the exchange of technical information and cooperation concerning the security of nuclear plants. [Buenos Aires LA PRENSA in Spanish 28 Nov 81]

CSO: 5100/2045

NUCLEAR AGREEMENT TO BE SIGNED WITH UK

PY021217 Rio de Janeiro O GLOBO in Portuguese 1 Dec 81 p 18

[Report by special correspondent Laura Fonseca]

[Text] London--Itamaraty announced yesterday that the negotiations regarding the nuclear cooperation agreement with Great Britain have ended successfully and that the document will be signed by Foreign Minister Saraiva Guerreiro and Lord Carrington during the last official meeting of the visit tomorrow morning.

The agreement is aimed at industrial cooperation and scientific research in areas in which Great Britain is well advanced, such as the treatment of atomic waste, security and the quality control of reactors.

An official Itamaraty source explained that as the Brazilian nuclear program is advancing, we will need to acquire first-rate technology in some phases of the cycle not covered in the Brazilian-FRG nuclear agreement. The document to be signed with Great Britain will thus complement the FRG-Brazilian cooperation.

Great Britain is interested in transferring nuclear technology and services to Brazil as a means of bringing down the cost of its own nuclear program, Itamaraty sources said.

Brazil needs cooperation in some key sectors of its program, such as the separation of radioactive elements in atomic waste, the treatment and storing of waste and scientific research in the field of nuclear fusion; the technology that will be dominant in the 21st century. The country already wishes to take the first steps in advanced technology in order to secure the continuity of the nuclear program and prevent it from becoming obsolete.

The document will have the form of a memorandum of agreement fixing sectors of immediate cooperation; it will serve, however, as a political basis for widening other cooperation areas in case of bilateral interest. Itamaraty has stated that the agreement has no connection with Angra I or any other specific reactors and can be used to cover needs of the Brazilian nuclear program as a whole.

Itamaraty explained that all opportunities should be taken advantage of to acquire scientific technology in the nuclear field, because these technologies serve as a guarantee for certain development with numerous applications in the industries of the future. The Brazilian Foreign Ministry denied that the cooperation with Great Britain is intended to replace parts of the Brazilian-FRG agreement, assuring that it is a scientific and industrial complement which will provide technological benefits for the nuclear program and other sectors of the country's economic development.

CSO: 5100/2041

BRAZIL

BRIEFS

NEW NUCLEAR POWER PLANTS--Sao Paulo, 22 Nov (TELAM)--Gen Jose Costa Cavalcanti, president of Eletrobras (Brazilian Electric Power Companies Inc) and of the Paraguayan-Brazilian binational organization ITAIPU, today said that Brazil will build two new nuclear power plants in Sao Paulo State in the year 2,000, in keeping with the Brazilian energy plan for that year. [Buenos Aires TELAM in Spanish 1230 GMT 22 Nov 81]

CSO: 5100/2041

SWEDEN HOPES FOR NUCLEAR PLANT CONTRACTS

Stockholm SVENSKA DAGBLADET in Swedish 6 Nov 81 p 26

> [Text] Swedish nuclear energy technology could get international recognition in Mexico. There are possibilities for extensive software and hardware deliveries here for the next few years.

"People at home do not realize what a fine position we hold in the area of nuclear technology," said Bo Persson, assistant director of the Asea subsidiary in Mexico. "In many ways, our position is better than that of our competitors.

"But there is also a drawback. In order for Sweden to sell nuclear energy technology here, there must be a working oil agreement with Mexico and that seems to be in jeopardy at present."

According to plans, Mexico will have 20 nuclear plants by the year 2000. The first two are under construction and the suppliers are American. Bids for two more plants are supposed to be in by February 1982 and the decision will be announced 6 months later. Asea-Atom has submitted a bid as have competitors from the United States, Canada and France. The bid concerns the reactor and the fuel production unit, but not the turbines.

Obvious Interest

The determination is far from being completed, but Mexico has shown obvious interest in long-term and intense cooperation with Sweden in the area of nuclear energy.

According to Bo Persson, the Swedish advantages are these:

"Sweden has learned how to develop nuclear energy on a limited scale, which also suits Mexico. Swedish nuclear energy technology is not only represented by Asea-Atom, but also Studsvik, Svensk Karnbransle-forsorjning, etc.

"That could possibly mean a coordinated effort. Together, we control the entire fuel cycle. Sweden has probably penetrated the fuel problem better than any other nation. No United States company knows all the technology."

Bo Persson added that Swedish-American cooperation in this area could lead to an important spin-off in Sweden, primarily in terms of component manufacture by subcontractors.

The Oil Problem

But back to the oil problem, which also concerns other Swedish interests in Mexico City. Mexico has decided to prioritize its economic connections, dealing only with a handful of countries, Sweden among them. When President Jose Lopez Portillo visited Stockholm in the spring of 1980 a Swedish-Mexican cooperative agreement was signed whereby Mexico would deliver 70,000 barrels of oil per day to Sweden.

Since then, the situation on the international oil market has changed considerably. Hence, Mexican oil, which is relatively expensive and consists partly of high sulphuric heavy oil, is less attractive.

Mexico determines the price quarterly and buyers--Swedish Petroleum (SP) and OK as far as Sweden is concerned--can opt not to buy the oil if they feel the price is too high. However, if the buyer decides not to buy a sufficient number of times, the contract is no longer valid.

SP and OK have decided not to import Mexican oil for the time being. The oil agreement is beginning to be viewed as a burden in Sweden.

"Shortsighted"

Carl Swartz, formerly Swedish ambassador to Mexico and presently head of the SE Bank's new office in Mexico City, thinks this is shortsighted.

"We only need to have something happen in the Middle East to completely change the market situation. One can understand the reluctance on the part of the two Swedish oil companies at this time, but as far as supplies are concerned, it is only good business to rely on a supplier outside the Middle East.

"Furthermore, Sweden's reluctance to buy oil seems to have affected Mexico's attitude toward us. Some of our competitors, who stopped buying oil when Mexico raised the price earlier this year, have since changed their minds and are now buying again. Sweden seems to have slipped a bit on the Mexican list of priorities," said Carl Swartz.

Important interests are at stake and Swedes in Mexico City stress that a solution to the problem is urgent. The time to negotiate desired adjustments in the oil agreement would be now when Mexico has some marketing problems.

8952
CSO: 5100/2038

BRIEFS

NUCLEAR AGREEMENT--Minister of Electricity Muhammad Mahir Abaza signed an agreement in Bonn yesterday for the construction by West Germany of two nuclear plants for the production of electricity in Egypt, at the cost of 5 billion German marks (1.85 billion Egyptian pounds). This is part of a program including the construction of eight nuclear plants by the year 2000. Minister for Research and Technology Andreas von Bulow, who signed the agreement on behalf of the Germans, said that his country considers the expansion [of usage] of nuclear power for peace purposes in the world necessary. Minister Abaza announced that the construction of the eight plants will provide 80 percent of Egypt's needs for [electrical] power through the year 2000. [Text] [Cairo AL-AHRAM in Arabic 27 Oct 81 p 1] 9455

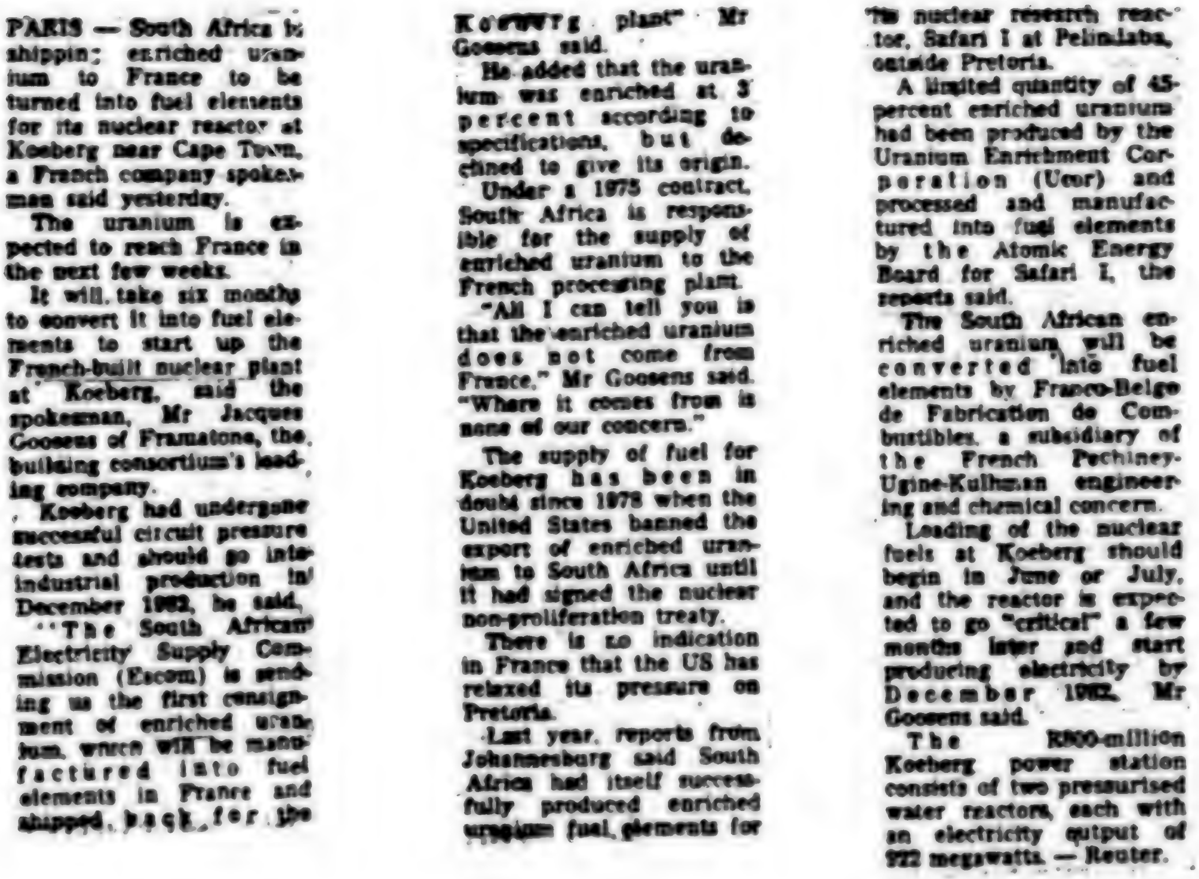
REACTOR SITES--Detailed studies for the locations of four nuclear plants will begin next week in the al-Daya'ah region, which will continue for 30 months. Scientists from Egypt and France will participate in these studies. A responsible source in the nuclear plant organization announced that the program of study includes identifying the location for each nuclear plant. Each plant will produce between 900 and 1,000 megawatts. They will also identify water inlets and outlets for cooling and the area's electrical network as well as connecting it to the overall network in Egypt. They will also study the safety and security of the area and the ground water and its paths, as well as the construction of a special port for the site to receive heavy equipment that may reach 500 tons for each piece. The source also said that previous studies included the construction of a huge watchtower that will be 100 meters in height to study the direction of wind, degrees of temperature and rainfall in the area. The site proved suitable in accordance with international safety levels. [Text] [Cairo AL-AHRAM in Arabic 7 Nov 81 p 1] 9455

CSO: 5100/5001

KOEBERG NUCLEAR FUEL LOADING WILL BEGIN IN JUNE

Johannesburg THE STAR in English 14 Nov 81 p 3

[Text]



PARIS — South Africa is shipping enriched uranium to France to be turned into fuel elements for its nuclear reactor at Koeberg near Cape Town, a French company spokesman said yesterday.

The uranium is expected to reach France in the next few weeks.

It will take six months to convert it into fuel elements to start up the French-built nuclear plant at Koeberg, said the spokesman, Mr Jacques Goosens of Framatone, the building consortium's leading company.

Koeberg had undergone successful circuit pressure tests and should go into industrial production in December 1982, he said.

"The South African Electricity Supply Commission (Escom) is sending us the first consignment of enriched uranium, which will be manufactured into fuel elements in France and shipped back for the Koeberg plant" Mr Goosens said.

He added that the uranium was enriched at 3 percent according to specifications, but declined to give its origin.

Under a 1975 contract, South Africa is responsible for the supply of enriched uranium to the French processing plant.

"All I can tell you is that the enriched uranium does not come from France," Mr Goosens said. "Where it comes from is none of our concern."

The supply of fuel for Koeberg has been in doubt since 1978 when the United States banned the export of enriched uranium to South Africa until it had signed the nuclear non-proliferation treaty.

There is no indication in France that the US has relaxed its pressure on Pretoria.

Last year, reports from Johannesburg said South Africa had itself successfully produced enriched uranium fuel elements for its nuclear research reactor, Safari I at Pelindaba, outside Pretoria.

A limited quantity of 45-percent enriched uranium had been produced by the Uranium Enrichment Corporation (Ucor) and processed and manufactured into fuel elements by the Atomic Energy Board for Safari I, the reports said.

The South African enriched uranium will be converted into fuel elements by Franco-Belge de Fabrication de Combustibles, a subsidiary of the French Pechiney-Ugine-Kulhman engineering and chemical concern.

Loading of the nuclear fuels at Koeberg should begin in June or July, and the reactor is expected to go "critical" a few months later and start producing electricity by December 1982, Mr Goosens said.

The R800-million Koeberg power station consists of two pressurised water reactors, each with an electricity output of 922 megawatts. — Reuter.

CSO: 5100/5608

RECENT STATUS OF ELECTRONUCLEAR CONSTRUCTION VIEWED

Paris REVUE GENERAL NUCLEAIRE in French Jul-Aug 81 pp 305-317

[Article by M. Poyatos, assistant head of SEPTEN, head of the pressurized water type reactor in EDF, and Y. Peyrouse, engineer in the Project Coordination Department of SEPTEN, in EDF]

[Text] The authors describe the progress status and the situation of the 900-megawatt electric and the 1,300-megawatt electric PWR [Pressurized Water Reactor] sections under construction or in operation. In this context, they draw up a report on the starting up of the first 900-megawatt electric sections.

After tying 14 900-megawatt PWR sections into the network in 16 months (March 1980 to June 1981), the French nuclear powerplant construction program is witnessing the results of the efforts made since 1974 on the first industrial series (CP-1 Program) executed by the French Electric Company [EDF] in accordance with the objectives specified by the public authorities.

Construction of the second industrial series of 900-megawatt sections (CP-2 Program) and of the first 1,300-megawatt sections (P-4 series of eight sections) is continuing, together with these placings in operation, which follow the ones in the preseries consisting of the Fessenheim and Bugey powerplants (six sections started up between April 1977 and July 1979). In addition, the civil engineering work on the second series of 1,300-megawatt sections (P-4 series of 14 sections) is well underway at present.

Table I summarizes the main characteristics and dates of tying into the network and of placing in industrial operation of the pressurized water sections of the French nuclear electric program.

The basic options differentiating the various projects mentioned above were described in the REVUE GENERALE NUCLEAIRE Number 4 of 1980.

Fessenheim, Bugey and CP-1 powerplants: paired 900-megawatt sections, each consisting of a reactor building with a single vessel and gastight metal sheathing housing a three-loop primary cooling circuit. The turbine room, common to all the sections on the site, is arranged tangentially with regard to the reactor buildings and houses a turboalternator set for each section, whose turbine consists of a HP [high pressure] unit and three LP [low pressure] units.

CP-2 powerplants: 900-megawatt sections, equipped with a nuclear island identical with the one for the CP-1 sections, but with an individual turbine room for each section and located radially with regard to the reactor building. The turbine consists of one HP unit and two LP units. It should be noted that, although the CP-1 powerplants were cooled either by open circuit or by closed circuit, all the CP-2 powerplants are cooled by closed circuit atmospheric coolant.

P-4 powerplants: 1,300-megawatt sections not paired, equipped with a reactor building with double vessel without airtight sheathing, housing a four-loop primary cooling circuit. Moreover, the mass plan for the section provides for making physical separation of the nuclear safeguard auxiliaries possible by erecting a special building for housing them. The turbine room is radial and the turbine consists of one HP unit and three LP units.

P'-4 powerplants: 1,300-megawatt sections with a design similar to the P-4 sections, with, in particular, identical primary circuit and turboalternator set. These sections were perfected, with regard to the P-4 project, with a concern for reducing costs with an equal quality. This option finds expression primarily in a reduction of the size of the buildings.

It should be noted that the Saint-Alban and Flamanville sections consist of a P-4 type nuclear island and a P'-4 type turbine room.

I. Progress Status of the 900-megawatt Powerplants

A. Industrial preseries: Fessenheim-1 and 2 and Bugey-2, 3, 4 and 5.

The six sections of the industrial preseries started between 1970 and 1972 are all in industrial operation. As of the end of April 1981, the two Fessenheim sections had produced over 37 terawatt-hours (1 TWh = 1 billion kWh; 37 TWh ≈ 8.2 million tons of oil equivalent) and were in their third fuel cycle. Their average availability, including period of fuel reloading, was 71 percent at the times of the third year of operation, or definitely greater than the availability anticipated by the PEON [Production of Energy of Nuclear Origin] Commission (60 percent). Outside of reloading, availability has been 88 percent.

The four sections of the Bugey powerplant had produced a total of 42 terawatt-hours as of that same date and had all completed the first fuel cycle. Particular note can be taken of the performance of sections 4 and 5 whose availability in the first year after placing in industrial operation was 78 percent and 85 percent, respectively, (to be compared with the PEON assumption of 50 percent for that period).

The lessons that can be derived from these first years of operation are developed in another article in this same periodical.

B. CP-1 powerplants: Tricastin, Gravelines, Dampierre, Le Blayais

These powerplants were started in 1974-1976 with an extension of two sections in 1980 (Gravelines-5 and 6). With the exception of these two last-mentioned sections, this program is in process of completion with placing in operation of the number 4 sections of Tricastin, Gravelines and Dampierre scheduled during the summer of 1981.

Table I: PWR Section Construction Schedule

NOM DE LA TRANCHE (1)	TYPE	PUISSANCE ELECTRIQUE NETTE (2)	REFRIGERATION OUVERT/FERME (3)	DATE COUPLAGE PREVUE A L'ORIGINE (4)	(5) DATE COUPLAGE REELLE OU PREVUE	(6) DATE MSI REELLE	ETAT DE LA TRANCHE (7)
(8) I - PRESERIE INDUSTRIELLE (TRANCHES 900 MW DE FESSENHEIM ET BUGEY)							
FESSENHEIM 1		890	(11) OUVERT	6-75	4.77	12-77	(13) EN SERVICE
FESSENHEIM 2		890	OUVERT	4-76	10-77	3-78	EN SERVICE
BUGEY 2		920	OUVERT	8-76	5-78	2-79	EN SERVICE
BUGEY 3		920	OUVERT	6-77	9-78	2-79	EN SERVICE
BUGEY 4		900	(12) FERME	3-78	3-79	7-79	EN SERVICE
BUGEY 5		900	FERME	8-78	7-79	1-80	EN SERVICE
(9) II - SERIE INDUSTRIELLE DE 900 MW (TRANCHES DES CONTRATS PROGRAMME CP1 ET CP2 ET LEURS EXTENSIONS							
TRICASTIN 1	CP1	920	OUVERT	10-78	5-80	12-80	EN SERVICE
GRAVELINES 1	CP1	920	OUVERT	12-78	3-80	12-80	EN SERVICE
DAMPIERRE 1	CP1	900	FERME	3-79	3-80	12-80	EN SERVICE
TRICASTIN 2	CP1	920	OUVERT	5-79	6-80	09-80	EN SERVICE
GRAVELINES 2	CP1	920	OUVERT	7-79	8-80	12-80	EN SERVICE
DAMPIERRE 2	CP1	900	FERME	10-79	12-80	2-81	EN SERVICE
TRICASTIN 3	CP1	920	OUVERT	12-79	2-81	5-81	EN SERVICE
GRAVELINES 3	CP1	920	OUVERT	2-80	12-80	6-81	EN SERVICE
DAMPIERRE 3	CP1	900	FERME	4-80	1-81	9-81	EN SERVICE
TRICASTIN 4	CP1	920	OUVERT	6-80	6-81		(14) DEMARRAGE EN COURS
ST-LAURENT 1	CP2	880	FERME	9-80	1-81		DEMARRAGE EN COURS
BLAYAIS 1	CP1	920	OUVERT	10-80	6-81		DEMARRAGE EN COURS
GRAVELINES 4	CP1	920	OUVERT	11-80	6-81		DEMARRAGE EN COURS
DAMPIERRE 4	CP1	900	FERME	1-81	8-81		DEMARRAGE EN COURS
ST-LAURENT 2	CP2	880	FERME	3-81	6-81		DEMARRAGE EN COURS
BLAYAIS 2	CP1	920	OUVERT	6-81	4-82		(15) ESSAIS AVANT DEMARRAGE
CHINON B-1	CP2	875	FERME	10-81	2-82		ESSAIS AVANT DEMARRAGE
CHINON B-2	CP2	875	FERME	3-82	8-82		(16) MONTAGES ELECTRO-MECANIQUES
BLAYAIS 3	CP1	920	OUVERT	5-82	10-82		MONTAGES ELECTRO-MECANIQUES
BLAYAIS 4	CP1	920	OUVERT	11-82	2-83		MONTAGES ELECTRO-MECANIQUES
CRUAS 1	CP2	880	FERME	3-83	5-83		ACHEVEMENT GENIE (17) CIVIL
CRUAS 2	CP2	880	FERME	8-83	9-83		ACHEVEMENT GENIE CIVIL
CRUAS 3	CP2	880	FERME	2-84	1-84		(18) GENIE CIVIL EN COURS
CRUAS 4	CP2	880	FERME	8-84	7-84		GENIE CIVIL EN COURS
GRAVELINES C5	CP1	920	OUVERT	9-84	9-84		GENIE CIVIL EN COURS
GRAVELINES C6	CP1	920	OUVERT	5-85	5-85		GENIE CIVIL EN COURS
CHINON B-3	CP2	875	FERME	2-86	2-86		(19) DEBUT GENIE CIVIL
CHINON B-4	CP2	875	FERME	10-86	10-86		DEBUT GENIE CIVIL
(10) III - SERIE INDUSTRIELLE DE 1300 MW (TRANCHES P4 ET P'4)							
PALUEL 1	P4	1285	OUVERT	9-82	4-83		MONTAGES ELECTRO-MECANIQUES
PALUEL 2	P4	1285	OUVERT	2-83	11-83		MONTAGES ELECTRO-MECANIQUES
PALUEL 3	P4	1285	OUVERT	3-84	6-83		GENIE CIVIL EN COURS
ST-ALBAN 1	P4	1300	OUVERT	8-84	8-84		GENIE CIVIL EN COURS
FLAMANVILLE 1	P4	1290	OUVERT	10-84	10-84		GENIE CIVIL EN COURS
CATTENOM 1	P'4	1270	FERME	4-85	4-85		GENIE CIVIL EN COURS
PALUEL 4	P4	1285	OUVERT	6-85	6-85		GENIE CIVIL EN COURS
ST-ALBAN 2	P4	1300	OUVERT	7-85	7-85		GENIE CIVIL EN COURS
FLAMANVILLE 2	P4	1290	OUVERT	9-85	9-85		GENIE CIVIL EN COURS
CATTENOM 2	P'4	1270	FERME	1-86	1-86		GENIE CIVIL EN COURS
BELLEVILLE 1	P'4	1275	FERME	6-86	6-86		DEBUT GENIE CIVIL
NOGENT 1	P'4	1275	FERME	1-87	1-87		DEBUT GENIE CIVIL
BELLEVILLE 2	P'4	1275	FERME	4-87	4-87		DEBUT GENIE CIVIL
CATTENOM 3 ●	P'4	1270	FERME	9-87	9-87		(20) FIN TERRASSEMENTS
NOGENT 2	P'4	1275	FERME	11-87	11-87		DEBUT GENIE CIVIL
GOLFECH 1 ●	P'4	1270	FERME	1-88	1-88		(21) DEBUT TERRASSEMENTS
CHOOZ B-1 ●	P'4	1270	FERME	4-88	4-88		(22) SITE NON OUVERT
CATTENOM 4 ●	P'4	1270	FERME	7-88	7-88		FIN TERRASSEMENTS
PENLY 1	P'4	1290	OUVERT	9-88	9-88		(23) TERRASSEMENTS EN COURS
GOLFECH 2 ●	P'4	1270	FERME	11-88	11-88		DEBUT TERRASSEMENTS
CHOOZ 2 ●	P'4	1270	FERME	2-89	2-89		SITE NON OUVERT
PENLY 2	P'4	1290	OUVERT	7-89	2-89		TERRASSEMENTS EN COURS

[Key on next page]

Key:

1. name of the section
2. net electric power
3. cooling, open or closed
4. original date scheduled for tying into network
5. actual or scheduled date for tying into network
6. actual date of placing in industrial operation
7. section status
8. I - industrial preseries (Fessenheim and Bugey 900-megawatt sections)
9. II - 900-megawatt industrial series (sections of the CP-1 and CP-2 program contracts and their extensions
10. III - 1,300-megawatt industrial series (P-4 and P'-4 sections)
11. open
12. closed
13. in operation
14. startup in progress
15. tests before startup
16. electromechanical assembly
17. completion civil engineering
18. civil engineering in progress
19. start of civil engineering
20. end of earthwork
21. start of earthwork
22. site not open
23. earthwork in progress

* sites "frozen" (in the purport of the 30 July 1981 decision of the ministerial cabinet)

a. Tricastin-1, 2, 3, 4

The first three sections are in industrial operation and attained a production of 10 terawatt-hours in May. After a malfunction that occurred in the alternator of section 1 between the time of going critical and tying into the network, this section reached its nominal power in 41 days after tying into the network, or definitely less than the specified schedule (2 months).

Section 4 was loaded with fuel at the end of April and was tied into the network on 12 June 1981. This made it possible to provide the full power of the group of four sections (3.68 terawatts electric) for the summer of 1981. Most of the production was intended for the EURODIF uranium enrichment plant located in the vicinity.

b. Gravelines B-1, 2, 3, 4 and C-5 and 6

The first three sections are in industrial operation. Just like Tricastin-1, Gravelines section 1 was shut down for 2 months to correct some alternator problems. Total production of the site reached 10 terawatt-hours in May and section number 4 was loaded with fuel at the end of April and was tied into the network on 14 June 1981.

Sections 5 and 6 are in the civil engineering phase. As of the end of May, 134,000 cubic meters of concrete, or 61 percent of the total for both sections, had been poured. The last support frame of reactor building number 5 was welded at the beginning of June and the storage batteries for section 6 will be installed in mid-June. Concrete work for the section 5 turboalternator set base was accomplished at the end of April.

c. Dampierre-1, 2, 3, 4

Sections 1, 2 and 3 are in industrial operation. Loading of section 4 was scheduled in June and tying into the network in August. Production of section 1 amounted to 5 terawatt-hours at the end of April and production of section 2 was 2 terawatt-hours. It is to be noted that the time period between tying into the network and placing into industrial operation of Dampierre-2 was only 2 months. That time period is, at present, the shortest for all powerplants in operation.

d. Blayais-1, 2, 3, 4

The four sections of Blayais were started at two separate times. This explains the relatively large time lag between pair 1-2 and pair 3-4.

Section 1 went critical at the beginning of May and was tied into the network on 14 June 1981. Cold-testing of section 2 are starting and should make a fuel load possible at the end of the year.

Sections 3 and 4 are in the phase of installation of the heavy equipment. The The vessel for section 3 was delivered in April with several months delay, owing to factory repairs resulting from the discovery of defects under the corrosion-resistant steel cladding of the pipes. The Blayais 4 vession should arrive in July 1981.

C. CP-2 Powerplants: Saint-Laurent, Chinon, Cruas

The CP-2 sections were started in 1876-1979, with an extension of two sections in 1981 (Chinon B-3, B-4). Startup tests of the two Saint-Laurent sections have begun and make it possible to reveal the details of the turbine room, which is entirely new in comparison with the CP-1 sections.

a. Saint-Laurent B-1, B-2

Section 1 was tied into the network at the end of January 1981. Tests at 50 percent nominal power were performed in February. Then the section had to be shut down for 2 months for repair of the drier-superheaters. After restarting the facility, nominal power was reached at the beginning of June. Section 2 was loaded with fuel in February and went critical at the beginning of May 1981. It was tied into the network on 1 June, only 3 months after the date that had been set in 1976 when the project was started.

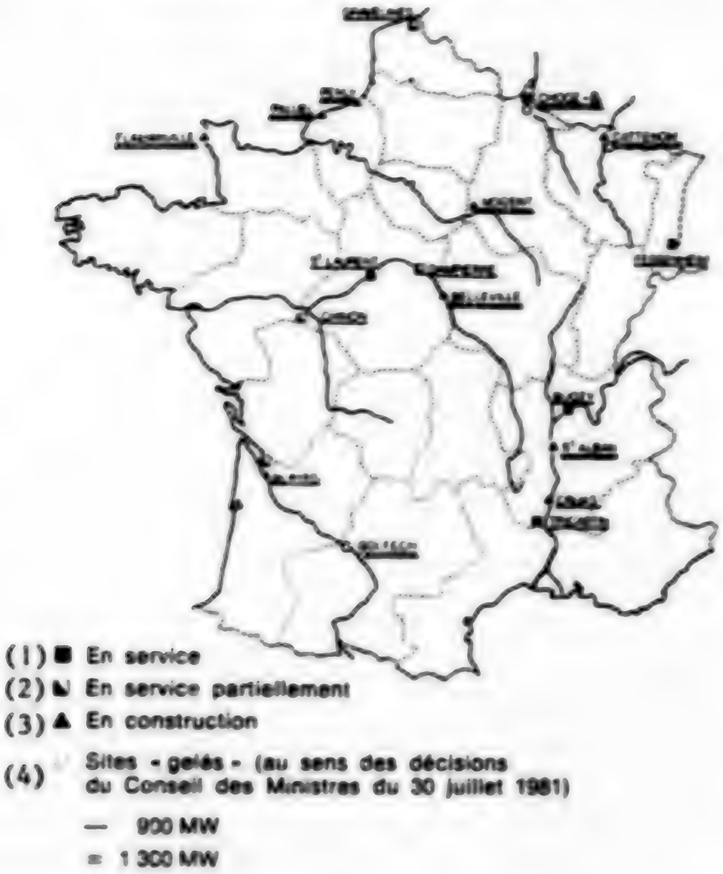
b. Chinon B-1, 2, 3, 4

At the same time as civil engineering is starting on sections 3 and 4, the electromechanical assembly is being completed on pair 1-2.

The first cold testing of section one with the vessel open has started and loading with fuel is scheduled for November 1981. The section 2 vessel was installed at the beginning of April and the first tests are scheduled in autumn 1981.

The Chinon B sections are characterized by forced-draft atmospheric cooling system (19 450-kilowatt fans). Tests on this new kind of cooling system were conducted successfully early in the year.

Nuclear Sites as of 1 August 1981


(1) ■ En service
(2) ◪ En service partiellement
(3) ▲ En construction
(4) Sites « gelés » (au sens des décisions du Conseil des Ministres du 30 juillet 1981)
— 900 MW
= 1 300 MW

Key:

1. in operation
2. in partial operation
3. under construction
4. "Frozen" sites (in the purport of the 30 July 1981 decisions by the ministerial cabinet)

Preparatory work on sections 3-4 has been completed and 55,000 cubic meters of concrete, or 30 percent of the total for both sections, had been poured by the end of May. When those sections go into operation in 1986, they will mark the end of the 900-megawatt PWR section construction program, which will then have 34 units.

c. Cruas-1, 2, 3, 4

Cruas, the last 900-megawatt site to be opened, witnessed commencement of its assembly phase with the installation of section 1 heavy equipment. Two steam generators were put in at the end of April.

The vessel is scheduled to arrive at the end of December 1981 with 5 months delay over the initial planning. The dome of the section 2 reactor building was put in place at the beginning of May. By that same date, reactor building 3 was at

21 meters and the foundation had been poured at -3.50 meters for reactor building 5. The bodies of the first three atmospheric cooling plants are finished, as well as the inside of cooling plant number 1. The framework of turbine room number 1 is in progress, as well as the framework of section 2.

II. Demonstration of the Step Effect on Construction of the 900-megawatt Sections

Figure 1 shows, for the 900-megawatt sections that have reached a significant stage of progress, the delays in tying into the network with regard to the originally scheduled dates, which were based on a deliberately very restricting planning of a pressing nature. The solid lines represent tie-ins accomplished and the dotted lines the ones forecast.

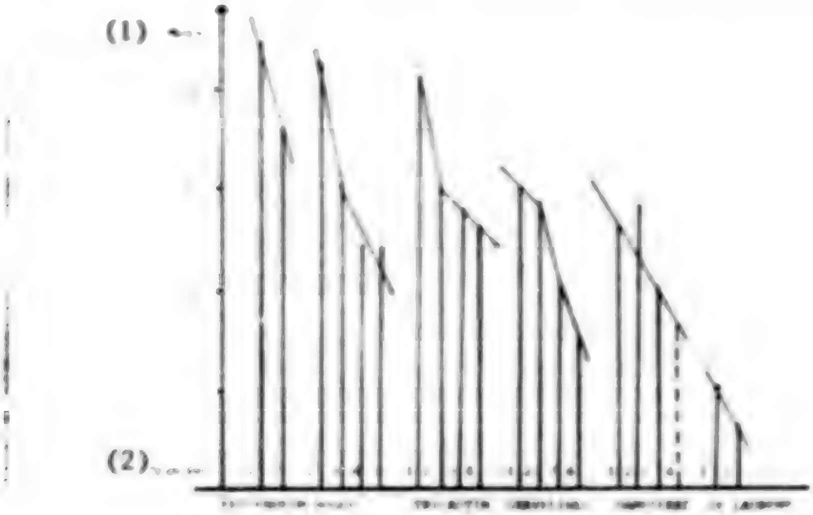


Figure 1: Tie-in delays with regard the dates originally scheduled.
Key: 1. months; 2. sections

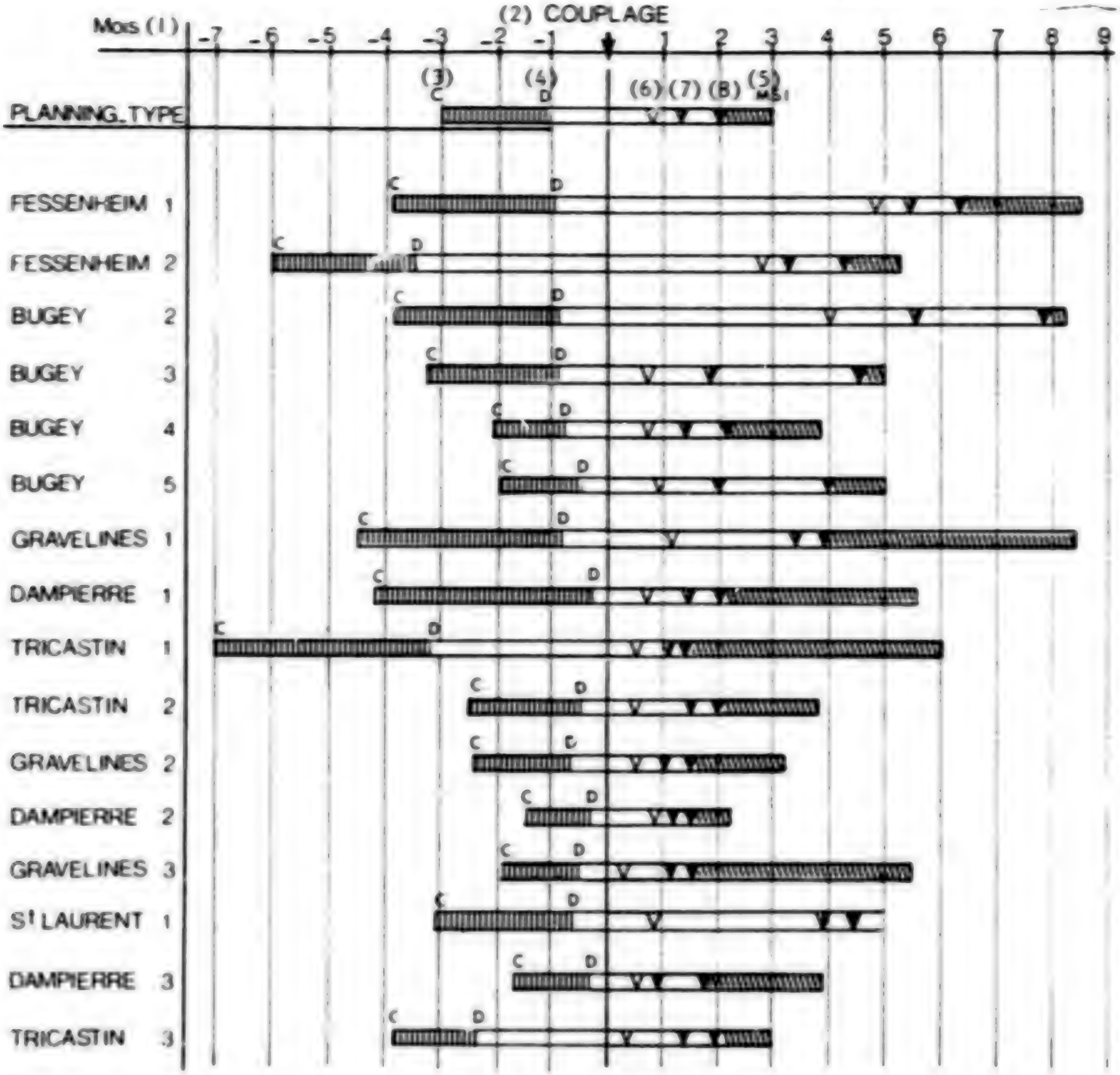
It is noted that the completion times decrease considerably from one section to the next for a given site, and from one site to the next, demonstrating the validity of the notion of the technical step effect making it possible to have the sections profit from the experience acquired on the preceding ones. Therefore, it can be thought that the small separation between two sections of one given site (6 months) did not allow this effect to work fully and that these results will be still more convincing for the 1,300-megawatt step where the separation between two sections is on the order of 10 months.

A peculiar point is observed at Dampierre-2, which is explained by a problem of welding on a primary pipe system that had to be redone. Nevertheless, this delay was utilized advantageously for preparing the starting tests that could be held in 4 months (the time period between loading and placing in industrial operation), or 2 months less than the typical planning.

III. Summary of the Startup of the First 900-megawatt SEctions

Table II shows the development of the startups of the first 16 900-megawatt sections. The times involved are to be compared with the scheduled nominal times: 3 months between fuel loading and tying into the network and 3 months between tying into the network and placing in industrial operation.

Table 11: Comparative Startup of the First Sixteen 900-megawatt Sections



Key:
1. month
2. network tie-in
3. fuel loading
4. criticality
5. placing in industrial operation
6. ∇ = 50% nominal power
7. ▼ = 75% nominal power
8. ▼ = 100% nominal power

This table shows the evolution between the first sections (Fessenheim, Bugey and sections 1 of Tricastin, Gravelines, Dampierre) whose average time between loading and placing in industrial operation was 10 months, and the following sections of CP-1 (Tricastin-2 and 3, Gravelines-2, Dampierre-2) whose average time between loading and placing in industrial operation was 6 months. This table also discloses a certain number of "abnormal" time periods resulting either from technical accidents or from procedures of an administrative nature. In particular, the

the long time between fuel loading and criticality of sections 1 of Tricastin, Gravelines and Dampierre was tied to an examination of the defects under the cladding of the vessel piping. The time between criticality and placing in industrial operation of those sections was due to problems encountered with the alternators, leading to a 2-month shutdown of each section. In addition, it is noted that the very short time period obtained for all the Dampierre sections between criticality and tying into the network (an average of 5 days), due primarily to the presence on the site of auxiliary boilers that made tests of the turboalternator sets possible before production of nuclear steam.

Table III gives the production of the sections in terawatt-hours during the first fuel cycle and also show the improvement in performance, on the one hand, between the sections of a given site (comparison of Fessenheim-1 and 2 or Bugety-4 and 5 with Bugey-2 and 3, and so on) and, on the other hand, between successive sites. This effect is entirely comparable with the one observed for construction times (see Section II, above).

Table III: Production at the End of n Months
in Terawatt-hours, after Network Tie-in

	Months					
	[illegible]	[illegible]	[illegible]	12	[illegible]	18
Fessenheim 1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fessenheim 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]				
[illegible]	[illegible]					
[illegible]						
[illegible]	[illegible]					
[illegible]	[illegible]					

It is observed, moreover, that Saint-Laurent-1, first in a series of an entirely new turbine room, experienced startup problems (driers-superchargers). This explains the low production value in the first 3 months.

Finally, it should be noted that the problems encountered with the alternators cost on the order of 2 months shutdown for sections number 1 of CP-1, or the equivalent of approximately 1.3 terawatt-hours, while the availability of the primary circuit was extremely high (≈ 90 percent for the entire CP-1).

IV. Progress of the 1,300-megawatt PWR Sections

Starting of work on the first 1,300-megawatt sections (Paluel-1) dates from 1977. Civil engineering work is well underway on the Paluel, Saint-Alban, Flamanville, Cattenon, Belleville and Nogent sites. Earthwork jobs have started at Golfech and Penly and the Chooz site is not yet open.

Construction of this kind of powerplant requires, in a period of full swing, around 3,500 percons on four-section sites and 2,000 persons on two-section sites. This personnel force consists, at the start, primarily of civil engineering teams, gradually replaced by electrical engineers and testing teams.

a. Paluel-1, 2, 3 and 4 Powerplant

The Paluel powerplant, which is the first 1,300-megawatt site in France, is in the assembly stage for the first two sections and in the civil engineering stage for sections 3 and 4 (there is a rather sizable gap--13 months--between section 2 and section 3).

The internal dome of reactor building number 1 has been completed since January 1981 and the four steam generators, as well as the pressurizer, have been installed. The vessel should arrive in July. Installation of the auxiliary piping system is 25 percent complete and delivery of the turboalternator set is in progress. The HP and LP rotors have been delivered to the site.

In section 2, the reactor building has been out of the water since October 1980 and the carrier for bringing in the heavy parts is operational.

For these two sections, the auxiliary steam and the demineralized water production functions are being tested, as well as the fans.

Delays of 7 to 9 months in tying these sections into the network are anticipated, primarily due to problems of manufacture of the primary equipment (vessel for Paluel-1 and steam generators for Paluel-2), in addition to a rather slow start of installation of the piping for the general electrical facilities. Nevertheless, general progress is very satisfactory in view of the head of series nature of the Paluel-1 and 2 sections.

The reactor building for section 3 is at the corbel support level of the treadway of the wing bridge and the foundation of reactor building 4 is concreted. With regard to section 3, 140,000 cubic meters of concrete have been poured and 30,000 for section 4 (for a total of 400,000 cubic meters per section pair).

The discharge structures are characterized by underwater tunnels discharging at about 1 kilometer from the coast. The tunnel for section 1 is finished and the earthwork for the discharge well is underway by means of a weighted platform resting on the sea bottom. The tunnel for section 2 is held up in its advance by sizable inflows of water (450 liters a second), requiring concreting of the tunnel in advance.

b. Saint-Alban-1 and 2 Powerplant

Only two sections are started on this site scheduled for four sections. Construction is still primarily in its civil engineering phase. Mechanical installations started on 15 April with the setting up of the swing bridge for reactor building 1 whose inner casing shaft is completed. The beams for the dome will be set up around 15 June 1981.

Concrete work on the foundation for the turboalternator set started on 15 May and 135,000 cubic meters of concrete have been poured in section 1, or about 80 percent of the total (this puts the progress of this section at the same level as the progress of Paluel-3).

In section 2, the outer casing of the reactor building is up to 26 meters, or the level of the material plug, and the amount of concrete poured is 80,000 cubic meters (47 percent of the total).

The intake channel is practically finished (92 percent) and the pumping station is 40 percent completed.

c. Flamanville-1 and 2 Powerplant

The Flamanville powerplant, of the same type as Saint-Alban, is running about 6 months behind it. Thus, in section 1, the level of the swing bridge should be reached on 15 August 1981 and the dome beams set up in January 1982. Concretework on the foundation for turboalternator set number 1 is scheduled in November 1981.

The Flamanville site, located on a cliff, is characterized by especially sizable earthwork, because the excavations made in the cliff served to fill up the platform of the turbine rooms, which was taken over from the sea.

The water intake jetties in the sea have been completed since the summer of 1980 and, at the pumping station, the casing for the first circulating pump has been poured, in addition to the overflow well for section 1 from where the sea discharge tunnel will start.

d. Cattenom-1 and 2 Powerplant

Two sections are scheduled on the Cattenom site. The civil engineering phase is in progress on these sections. Section 1, the head of series of the P'-4 stage, should be tied into the network in April 1985. Four years before that date, 73,000 cubic meters of concrete had been poured for section 1 (45 percent of the total) and 37,000 cubic meters for section 2.

In section 1, the outer casing of the reactor building is up to 40 meters and the inner casing up to 19 meters. The other buildings of the nuclear island have risen 5 to 10 meters above the ground. The piling for the turboalternator set foundation has been completed and the foundation is in process of reinforcement.

In section 2, the outer casing is at the +23-meter level and the basements of the buildings are finished. The solid mass under the foundation piling for the turboalternator set is being concreted.

The atmospheric cooling plant for section 1 has reached a height of 31 meters. The X posts and two embankments have been completed. The X posts for the second cooling plant are in process of concreting.

Belleville-1 and 2 Powerplant

The general earthwork for the Belleville powerplant is being completed with 4.28 million cubic meters of earth fill put in by the end of May 1981.

With regard to the main civil engineering, 82,700 cubic meters of concrete were poured in the two sections, or 28 percent of the total, excluding cooling plants.

Reactor building number 1 is at a height of 21 meters (or progress comparable with Cattenom section 2) and the foundation for section 2 is being laid.

The Belleville site is characterized by a more developed prefabrication experiment than with the preceding sites. The guidelines of the company responsible for the main civil engineering work provide for prefabricating between 400 and 600 20- to 50-ton packages of concrete for both sections. In addition, a number of 3- to 6 ton packages of reinforcement rods are provided for.

f. Nogent-1 and 2 Powerplant

Earthwork for the Nogent powerplant, which started in April 1980, is being continued at a daily rate on the order of 11,000 cubic meters of fill. The platform for the power station is practically finished with 2 million cubic meters used. Earthwork for the two large water intake and discharge basins is in progress.

The first cleaning concrete was poured at the end of April and the foundation concrete for the reactor number 1 pad was poured in mid-May. The first concrete for the structure of reactor number 1 was poured on 26 May.

g. Golfech, Penly and Chooz Powerplants

At Golfech, only the safeguard jobs, connected with protection against flooding, are in progress at present.

Considerable earthwork is in progress at Penly owing to the features of the site located on a cliff. At the beginning of May, the straight part of the frontal seawall was completed (770 meters long) and a 13-hectare area was won from the sea. The total combined excavation and fill amounted to 3.82 million cubic meters.

Opening of the Chooz site is scheduled depending on the program of the Economic and Social Development Fund for 1982-1983, but, as of now, location of the sections involved has not been definitely determined.

Acquisition of land has been suspended and construction work will not be started until a decision is made by the public authorities.

Conclusion

April 1977: the first 900-megawatt section tied into the network.

March 1980: the first section of the CP-1 multiyear contract tied in.

January 1981: the first section of the CP-2 multiyear contract tied in.

First half of 1983: scheduled placing in operation of the first section of the 1,300-megawatt PWR stage.

These few key dates mark the development of France's nuclear program whose effect produced by the sections in operation on the EDF grid is already very significant.

By mid-1981, almost two-thirds of the sections of the 900-megawatt stage (20 out of 24) are tied into the network and represent 18,000 megawatts and over 45 percent of the installed power of EDF's thermal grid. Likewise, since the end of 1980, 1 kilowatt-hour out of 3 produced by EDF has been of nuclear origin.

For the 900-megawatt stage, the Equipment Bureau anticipated a time period of 53 to 56 months with no margin and of a conducive nature between the order for making the nuclear boiler and tying into the network, depending on the type and location of the section on the site. Equilibrium was to be reached in 60 months (a shorter time was observed for Saint-Laurent B-1). This is a remarkable industrial performance, in comparison with foreign achievements. In fact, the experience accumulated as a stage developed, benefiting the subsequent sections, is one of the great features of the construction and placing in operation of the 900-megawatt PWR sections.

This acquisition is characterized:

By the "step effect" making it possible to take into account the difficulties encountered with the first sections.

By the "site effect" representing the experience acquired by the personnel responsible for tests and for operation.

The first phase, the civil engineering phase, is not experiencing any appreciable gaps between beginning and ending sections, because it is not very dependent on delays outside construction work.

On the other hand, the second phase, concerning primarily installation of the equipment on the site, generates gaps caused by the following:

Delays in supplying major components for primary circuit.

Time taken for execution studies, owing to modifications introduced with regard to the "series heads."

The third phase concerns tests on subassemblies, then cold and hot testing of assemblies. This phase, like the following ones, discloses the importance of the "site effect" that causes the subsequent sections of a site to benefit from the experience previous acquired by the personnel.

The fourth phase involves precritical tests preparing for criticality and then the low-power physical tests concluding with tying into the network. This period, closely connected with the quality of the preceding tests, is not experiencing any considerable delay gap, with the exception of aleatory events like:

The incident encountered on the Tricastin-1 alternator.

The supplementary inspections demanded by the Administration within the framework of the investigations pertaining to the defects under the cladding that could not be carried out in "time concealed" for the first CP-1 sections.

Starting with the tie-in into the network, the startup phase, strictly speaking, is entered. This phase ends with the placing in industrial service (MSI) marking the start of industrial utilization of the section without any special restrictions with regard to the grid. The time between tying into the network and the MSI date is on the order of 7 to 9 months for the first sections. Then it drops to 4 months and even less for the next sections.

Finally, it should be noted that, for 1980, the average availability of all the 900-megawatt PWR sections in industrial operation was greater than 85 percent, with the exception of shutdowns for fuel reloading and inspection.

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BREAKDOWN IN RINGHALS III NUCLEAR PLANT PROVES COSTLY

Stockholm SVENSKA DAGBLADET in Swedish 29 Nov 81 p 5

[Text] The cost of the breakdown at Ringhals III nuclear plant could be over 300 million kronor in lost revenues alone. Furthermore, it looks like Vattenfall will have to pay for most of the repairs despite the fact that the shutdown was caused by faulty construction that might be traced to the American supplier, Westinghouse.

Energy Minister Ingemar Eliasson explained to Parliament last Friday it may take up to 6 months before Ringhals III is back in operation again.

"Ringhals III delivers 915 megawatts, which means that if the price of energy is 10 ore per kilowatt hour the stoppage would cost in excess of 2 million kronor per day," according to Olle Blomqvist at Vattenfall. "But we do not expect Ringhals III to be out of service very long. We hope to have it functioning by Christmas."

Vattenfall's program is to plug the defective pipes in the steam generator so as to be able to start the plant and run it at a reduced output, making sure there are no excessive vibrations.

However, this program must be approved by the Nuclear Energy Inspection Board (SKI) before the reactor can be started again.

Neither Vattenfall nor SKI want to say how long it might take to completely repair Ringhals III.

It is clear, however, that Vattenfall will have to pay for all the repairs. Ringhals III was tested, delivered and accepted by Vattenfall so that Westinghouse no longer bears the chief responsibility.

However, Westinghouse is still responsible for Ringhals IV, which has already been built but which according to plans will not be loaded until April.

If it is proven there are some defects in the construction of Ringhals III that must also be corrected on reactor IV, Westinghouse will have to pay for work done on the latter reactor.

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